4.5 #1-25 odd; #27-47 odd	solving exponential equations; solving logarithmic equations
4.6 #5,7,9,15,17	application problems with logs/exp functions
10.1 #7,9,23-31odd #59,63,67	find the general (nth) term of the sequence write sigma notation
10.2 #9,15,19,21,25,29, 35,37	arithmetic sequences and series
10.3 #15,19,21,25,35,37,43,45,49,57	geometric sequences and series
10.7 #1,7,21,27,31-39odd	binomial theorem

Quiz on log/exp equations & applications - 8th per: Wed; 1st per: Thurs

Test #4 - Mon. Feb 6

Final Exam - Wed. Feb 15

Binomial Coefficients

$\binom{n}{k}$ = "n choose k"

= the total # of combinations of n objects taken K at a time

$$\binom{n}{k} = \frac{n!}{k!(n-k)!}$$

"n factorial"

$n! = n(n-1)(n-2)\cdots 2\cdot 1$

$5! = 5\cdot 4\cdot 3\cdot 2\cdot 1$

Given a class of 17 students, how many groups of 5 can we make?

$$\binom{17}{5} = \frac{17!}{5!(17-5)!} = \frac{17!}{5!\,12!} = \frac{17 \cdot \cancel{16}^{2} \cdot \cancel{15} \cdot 14 \cdot 13 \cdot \cancel{12}}{\cancel{5 \cdot 4 \cdot 3 \cdot 2 \cdot 1} \cdot \cancel{12}}$$

$$= 17 \cdot 2 \cdot 14 \cdot 13$$

$$= \boxed{6188}$$

nCr

17 nCr 5

The Binomial Theorem:

$$(a+b)^n = \sum_{k=0}^{n} \binom{n}{k} a^{n-k} b^k$$

In particular,

The $(k+1)^{st}$ term of $(a+b)^n$ is

$$\binom{n}{k} a^{n-k} b^k$$

Find the 5^{th} term of $(p-2q)^9$

$5 = k+1 \Rightarrow k=4$

$a = p$ $\quad b = -2q$ $\quad n = 9$ $\quad k = 4$

$5^{th} = 4+1^{st}$

$(k+1)^{st}$ term of $(a+b)^n$ is $\binom{n}{k} a^{n-k} b^k$

5^{th} term of $(p-2q)^9$ is

$$\binom{9}{4} p^{9-4} (-2q)^4$$

$$\frac{9!}{4!(9-4)!} p^5 (16q^4) = \frac{9 \cdot 8 \cdot 7 \cdot 6 \cdot 5!}{4 \cdot 3 \cdot 2 \cdot 1 \cdot 5!} \cdot 16 p^5 q^4$$

$$9 \cdot 2 \cdot 7 \cdot 16 p^5 q^4$$

$$= 2016 p^5 q^4$$